

ORIGINAL ARTICLE

Validation of the Spanish Personal and Social Performance scale (PSP) in outpatients with stable and unstable schizophrenia

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Abstract

Introduction: The main long-term therapeutic goals of schizophrenia should go beyond the symptoms and include the improvement of patients' psychosocial functioning and quality of life. The aim of this study was to validate the Personal and Social Performance (PSP) scale in Spanish outpatients with schizophrenia.

Materials and methods: Naturalistic, 6-month follow-up, multicentre study. 244 patients and 76 controls were evaluated using the PSP, the Social and Occupational Functioning Assessment Scale (SOFAS), and the Clinical Global Impression-Severity (CGI-S) and Change (CGI-C) scales.

Results: Internal reliability= 0.87. Test-retest reliability= 0.98. Construct validity= 1 component that explained 73.2% of the variance. Convergent validity: Pearson correlation coefficient between PSP and SOFAS= 0.95 ($p<0.0001$), between PSP and CGI-S= -0.88 ($p<0.0001$). Discriminant validity: the PSP discriminates between patients and controls [50.3 versus 91.9, $p<0.0001$] and among patients with mild, moderate, and severe schizophrenia according to CGI-S scores [73 versus 56.6 versus 37.5, $p<0.0001$]. Area under the curve= 0.986. A cut-off point of 79 on the PSP scale provided good sensitivity (94.3%) and specificity (96.1%) for identifying patients and controls according to their level of functioning. At month 6 significant improvements ($p<0.0001$) were seen in PSP, SOFAS, and CGI-C scores. The PSP was sensitive to improvement; a score of very much improved in the CGI-C corresponds to an improvement of 34 points in the PSP.

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PALABRAS CLAVE

PSP;
 Funcionamiento social;
 Funcionamiento personal;
 Esquizofrenia;
 Propiedades psicométricas

Conclusion: The Spanish PSP is a reliable, valid and sensitive instrument for measuring functioning in outpatients with schizophrenia. As a brief, clinician-rated instrument, the PSP scale seems to be appropriate for use in everyday clinical practice as a mean of identifying and monitoring changes in patient's functioning.

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Validación de la versión española de la escala de Funcionamiento Personal y Social en pacientes ambulatorios con esquizofrenia estable o inestable

Resumen

Introducción: Uno de los objetivos terapéuticos principales a largo plazo en la esquizofrenia incluye la mejoría en el funcionamiento psicosocial y la calidad de vida del paciente. El objetivo de este estudio fue validar la versión española de la escala de Funcionamiento Personal y Social (PSP, del inglés Personal and Social Performance) en pacientes ambulatorios con esquizofrenia.

Material y métodos: Estudio naturalístico, de 6 meses de seguimiento, multicéntrico, en el que se evaluó a 244 pacientes ambulatorios y 76 controles con la PSP, la Escala de Evaluación del Funcionamiento Social y Ocupacional (SOFAS, del inglés Social and Occupational Functioning Assessment Scale) y la Escala de Evaluación de Gravedad de la Enfermedad (ICG-G, en sus siglas en inglés)/Impresión Clínica Global del Cambio (ICG-C).

Resultados: La consistencia interna fue de 0,87, la fiabilidad test-retest, de 0,98, y la validez de constructo, 1, componente que explicaba el 73,2% de la varianza. Validez convergente: coeficiente de correlación entre las puntuaciones PSP y SOFAS = 0,95 ($p < 0,0001$), y entre PSP e ICG-G = -0,88 ($p < 0,0001$). Validez discriminante: la PSP diferenció entre pacientes y controles (50,3 frente a 91,9; $p < 0,0001$), y entre pacientes con esquizofrenia leve, moderada y grave en función de la puntuación en la ICG-G (73 frente a 56,6 frente a 37,5; $p < 0,0001$). El área bajo la curva fue de 0,986. Para un punto de corte de 79, la PSP identificó a pacientes y controles según su nivel de funcionamiento con una sensibilidad del 94,3% y una especificidad del 96,1%. En el sexto mes se observaron mejorías significativas ($p < 0,0001$) en las puntuaciones PSP, SOFAS e ICG-C. La PSP demostró ser sensible a los cambios; una puntuación de mucha mejoría en la ICG-C correspondía a una mejoría de 34 puntos en la PSP.

Conclusión: La versión española de la PSP es un instrumento fiable, válido y sensible para medir el funcionamiento de los pacientes ambulatorios con esquizofrenia. Dada su brevedad, es un instrumento apropiado para ser utilizado en la práctica clínica cotidiana para cuantificar y controlar el funcionamiento de los pacientes.

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Introduction

Schizophrenia is a chronic and disabling mental disorder that frequently leads to substantial deficits in personal, social and occupational functioning. Indeed, impairment in psychosocial functioning is one of the DSM core characteristics since DSM-III¹ and has been well described in patients with mental disorders, particularly schizophrenia.^{2,3} Thus, the main long-term therapeutic goals of schizophrenia should go beyond the symptoms and include the improvement of patients' psychosocial functioning and quality of life.⁴⁻⁸ Psychosocial, vocational, and pharmacological therapies for schizophrenia are in continuous evolution in an effort to act comprehensively for changing the outcome expectations among clinicians, patients and their families, and being in agreement with the FDA⁹ definition of "treatment benefit", the effect of treatment on how a patient survives, feels or functions.

To be able to capture changes in outcomes, Andreasen et al.¹⁰ proposed a set of operational criteria for identifying

symptomatic remission in patients with schizophrenia. However, improvement in symptoms does not directly imply improvement in functioning^{3,11,12} and, consequently, functional remission remains as an outcome goal hard to measure and out of the daily clinical practice scope.

Since 1980 several efforts have been made in order to develop instruments more accurate and sophisticated for measuring the level of functioning -or impairment- in patients with severe mental disorders. The simplest and earliest measures such as the Global Assessment of Functioning -GAF¹³- and the Social and Occupational Functioning Assessment Scale -SOFAS-,¹⁴ have been overcome by the newest generation of instruments including the Personal and Social Performance -PSP¹⁵- scale, the Schizophrenia Outcomes Functioning Interview -SOFI-,¹⁶ and the Functional Remission of General Schizophrenia -FROGS¹⁷- scale. These instruments are characterized for being symptom's free -i.e., they do not include items that reflect clinical symptoms-, multidimensional and psychometrically sound.

Morosini et al.¹⁵ using the SOFAS as a model, developed the PSP with the following advantages upon its predecessor: a more clear definition of the functional areas to be measured and questions to be done, and degrees of disability with operational criteria to be employed in the rating process, leading to an excellent inter-rater reliability without losing brevity -5 to 10 minutes-. It has been validated in acutely ill out and inpatients,¹⁸⁻²⁰ and in stable patients living in the community.^{18,21,22} It was also used in the clinical trials that suggested that paliperidone ER had a meaningful treatment benefit in terms of improving personal and social functioning in patients with schizophrenia.^{23,24}

The SOFI¹⁶ showed acceptable construct validity and inter-rater reliability, and good test-retest reliability. However, the long time it takes to be administered -30-45 minutes to a trained interviewer- represents a main obstacle to be used in daily clinical practice in the public psychiatric services. On the other hand, the original FROGS¹⁷ needs further work for demonstrating its acceptability, predictive validity, and sensitivity to change.

Taking into account the above, we decide to conduct the present study with the aims of translating into Spanish and validating the PSP scale in Spanish stable and unstable outpatients with schizophrenia under standard treatment.

Subjects and methods

Study design

This is a naturalistic, 6-month follow-up, validation study conducted at 13 centres in Spain. It was approved by the Ethics Committee for Clinical Research of one of the centres Hospital clinic San Carlos, Madrid, Spain and is in accordance with 1975 Declaration of Helsinki, as revised in 1983. Written informed consent was obtained from all subjects prior to enrolment.

Subjects

Participants included 320 subjects (244 outpatients with schizophrenia -145 unstable and 99 stable-, and 76 healthy controls). Unstable was defined as those patients starting antipsychotic treatment or switching their current antipsychotic treatment due to lack of efficacy in the past 3 months. Stable were those patients who were clinically stable and did not require any change in their current antipsychotic treatment during the 3 past months.

Patients were enrolled in the study from July to December 2008. Patients' inclusion criteria were (1) age \geq 18 years; (2) ICD-10 diagnosis of schizophrenic disorder; (3) currently on outpatient treatment for his/her illness; and (4) written informed consent to participate in the study. Controls' inclusion criteria were 1) age \geq 18 years; (2) without mental or relevant physical disorder; (3) CGI-S score=1; and (4) written informed consent to participate in the study.

Exclusion criteria were designed to be minimal, due to the nature of the study, and only included the refusal of the subjects to participate in the study.

Clinical measures

For all patients and controls, demographic and clinical data as well as the following instruments were completed at baseline. Unstable patients were re-evaluated at months 3 and 6 and stable patients at week 1. All raters were trained to rate the PSP.

The *Personal and Social Performance scale (PSP)*¹⁵ is a clinician-rated instrument that evaluates the functioning of the patient in the following 4 areas: (1) self-care, (2) socially useful activities, including work and study, (3) personal and social relationships, and (4) disturbing and aggressive behaviours. Along with the PSP, the authors developed a semi-structured interview that helps clinicians to obtain the pertinent information in each area.

Taking into account the information gathered, clinicians score the 4 areas according to given operational criteria using a 6-point severity Likert scale ranging from 1 (absent) to 6 (very severe). Areas 1 to 3 share the operational criteria while area 4 has its own operational criteria to help clinicians to judge the severity of the difficulties the patient has.

The PSP scoring is a 3-step process; first, using the operational criteria, clinicians rate the severity of the difficulties in the 4 areas; second, using a scoring algorithm these 4 scores are transformed into a 10-point interval score ranging from 1-10 (lack of autonomy in basic functioning) to 91-100 (excellent functioning in all 4 main areas); and thirdly, taking into account the functioning in a list of other 9 life areas one single score is selected from the 10-point interval.

It provides scores on each of the 4 areas where higher scores indicate worse functioning, and a single global score where higher scores reflect better personal and social functioning. The Spanish PSP scale and scoring instructions are shown in the Appendix. The PSP semi-structured interview will be provided by request to the correspondent author.

The *Social and Occupational Functioning Assessment Scale (SOFAS)*¹⁴ is a modified version of the Global Assessment of Functioning (GAF)¹³ that was incorporated to the DSM-IV Axis V.²⁵ The SOFAS evaluates the individual's level of social and occupational functioning without taking into account the patient's symptoms and psychological functioning.²⁶ It provides a single overall score ranging from 1 to 100; the higher the score the better the functioning.

The *Clinical Global Impression (CGI)*²⁷ is one of the most widely used brief assessment instruments in psychiatry. We used the CGI-S, that measures illness severity, and the CGI-C, that measures change. Both are rated by the clinician using a 7-point Likert scale of intensity (1=normal to 7=among the most severely ill patients in the case of the CGI-S, and 1=much improved to 7=much worsened in the case of the CGI-C).

Statistical analysis

The statistical analysis was done using the SPSS 15. The two-tailed level of significance used was 0.05. Chi-square, independent and paired-samples *t* test, and ANOVA were

used to determine statistically significant differences according to clinical status.

Internal consistency was calculated for the total PSP using the Cronbach's alpha coefficient. Test-retest reliability was calculated by means of the Intraclass correlation coefficient using the data from the stable patients ($n=99$). The interval period between test and retest was 1 week.

For analysing the dimensional structure of the PSP, we used the principal component analysis (PCA) with Varimax rotation.

Convergent validity was calculated using the Pearson correlation coefficient between the total PSP score and scores on the SOFAS and CGI-S.

For analysing the discriminant validity, patients were classified in three groups based on their CGI-S scores: mildly ill (CGI-S scores 2-3), moderately ill (CGI-S score 4), and severely ill (CGI-S scores 5-7). An ANOVA test was used to identify statistically significant differences in the PSP scores according to severity groups. The independent t test was employed to determine statistically significant differences in the PSP scores between patients and controls.

The diagnostic performance of the PSP to discriminate between patients and controls was analysed using the receiver operating characteristic (ROC) curve.

Finally, the sensitivity to change was evaluated based on a 1-category improvement in the CGI-C score. Paired-samples t test was used to determine the mean PSP score change for each CGI-C category. Only data from unstable patients ($n=126$, 19 patients were lost in the follow-up) were used in this analysis.

Results

Sample

Table 1 shows demographic and clinical characteristics for the total sample and for patients and controls separately.

Psychometric properties

Descriptive statistics

Table 2 shows the means and standard deviations of the 4 main areas of the PSP, both for the total sample and for patients and controls separately.

The mean total PSP score was 60.2 ($sd=24.3$). Unstable patients scored significantly lower than stable patients and controls, and stable patients scored also significantly lower than controls (43.4 versus 60.3 versus 91.9, $F=259.34$, $p<0.0001$).

Reliability

The PSP scale had good internal consistency, with Cronbach's alpha of 0.874. Test-retest reliability was also excellent, with an Intraclass correlation coefficient of 0.979 (95% CI=0.969-0.986).

Construct validity

The principal component analysis identified one unique component, "functioning level" that included the 4 items

of the PSP. This component explained 73.2% of the variance. A second analysis was performed that found 2 forced components: "personal activities and relationships" (component 1) and "aggressive behaviour" (component 2). These two components explained 58.5% and 30.2% of the variance respectively. Loadings are shown in table 3.

Convergent validity

The Pearson correlation coefficient between the score on the PSP and on the SOFAS was 0.954 ($p<0.0001$). In the case of the CGI-S the coefficient was -0.878 ($p<0.0001$).

Discriminant validity

The PSP discriminated between patients and controls ($p<0.0001$). Furthermore, it was able to discriminate among patients with mild, moderate, and severe schizophrenic disorder according to CGI-S scores ($p<0.0001$). Table 4 shows the mean PSP scores for patients and controls and for each patient severity group.

Finally, we examined the accuracy of the PSP in discriminating control subjects from patients. The area under the curve was 0.986 (95% CI=0.9772-0.9959), indicating very good accuracy of the test. A cut-off point of 79 on the PSP scale provided good sensitivity (94.3%) and specificity (96.1%) (fig. 1). Predictive values were: positive 98.7% and negative 83.9%.

Sensitivity to change

At 6 months of follow-up total PSP score and scores on every PSP domain had significantly improved ($p<0.0001$), as well as scores on the CGI-S ($p<0.0001$) and on the SOFAS ($p<0.0001$).

Improvement on PSP scores were as follows: self-care 0.433 points (95% CI 0.279-0.587), socially useful activities 0.551 points (95% CI 0.360-0.742), personal and social relationships 0.583 points (95% CI 0.391-0.775), disturbing and aggressive behaviours 0.646 points (95% CI 0.409-0.882), and total score -11.39 points (95% CI -14.44 - -8.327). Improvement on CGI-S score was 0.945 points (95% CI 0.708-1.181) and on SOFAS -10.25 points (95% CI -13.17 - -7.340).

Mean CGI-C score at month 6 was 2.8 ($sd=1.3$). A total of 86 patients (68.2%) experienced improvement at some degree, 29 patients (23%) did not experience changes at all, and 11 patients (9.7%) experienced some degree of worsening. In table 5 we show the total PSP score change for each CGI-C category.

Discussion

Since both, scientific societies⁵ and drug regulatory agencies (EMA²⁸ and FDA⁹) emphasize in the importance of providing clinicians with adequately developed, valid and reliable instruments to measure other outcomes than symptoms, such as functioning and quality of life, we decided to conduct this study with the aim of validating the Spanish version of the PSP in a sample of stable and unstable outpatients with schizophrenia receiving standard treatment. We found good psychometric properties, which present the PSP as a reliable, valid, and sensitive instrument

Table 1 Demographic and clinical characteristics for the total sample and for patients and controls separately

	Total sample n=320	Unstable patients n=145	Stable patients n=99	Controls n=76	Statistical test	p
Mean age (sd)	37.7 (11.8)	38.9 (12.1)	37.2 (10.4)	35.9 (12.8)	1.74 ^a	0.176
Gender, males [n (%)]	209 (65.3)	101 (69.6)	75 (75.7)	33 (43.4)	20.388 ^b	<0.0001
Race, Caucasian [n (%)]	282 (88.1)	132 (91.0)	86 (86.9)	64 (84.2)	7.587 ^b	0.022
Educational level [n (%)]					58.983 ^b	<0.0001
No formal education	15 (4.7)	10 (6.9)	4 (4.0)	1 (1.3)		
Primary school	142 (44.4)	79 (54.9)	45 (45.4)	18 (23.7)		
Secondary school	92 (28.7)	41 (28.3)	33 (33.3)	18 (23.7)		
University	66 (20.6)	12 (8.3)	16 (16.2)	38 (50.0)		
Work status [n (%)]					160.717 ^b	<0.0001
Working	90 (28.3)	11 (7.6)	19 (19.2)	60 (80.0)		
Not working ^e	203 (63.8)	126 (87.5)	75 (75.7)	2 (2.7)		
Housewife	8 (2.5)	4 (2.8)	2 (2.0)	2 (2.7)		
Student ^f	32 (10.1)	9 (6.2)	4 (4.0)	19 (25.3)		
Schizophrenia subtype, paranoid [n (%)]	201 (82.3)	121 (83.4)	80 (80.8)	N/A	3.913 ^b	0.271
Mean number of previous episodes (sd)	5.6 (5.9)	6.6 (6.2)	5.0 (5.3)	N/A	1.78 ^c	0.076
Mean CGI-S score (sd) ^g	3.7 (1.7)	4.9 (1.0)	3.8 (0.9)	1.0 (0.0)	526.20 ^{a,d}	<0.0001
Mean SOFAS score (sd) ^g	59.9 (23.5)	43.6 (15.7)	59.8 (15.7)	91.7 (5.9)	287.25 ^{a,d}	<0.0001

sd: standar deviation.

^aANOVA F value.^bChi-square test.^cStudent's t test.^dDuncan test. sd=standard deviation.^eNot working included: permanent and temporary disabled, retired, and unemployed.^f9 unstable patients, 1 stable patient, and 8 controls work and study.^gDuncan test showed that the 3 groups were different among them**Table 2** Mean and standard deviation of PSP main areas and total score for the total sample and for patients and controls separately

	Total sample n=320		Unstable patients n=145		Stable patients n=99		Controls n=76		ANOVA, F value	p
	Mean	sd	Mean	sd	Mean	sd	Mean	sd		
Self-care	2.1	1.2	2.8	1.6	2.0	0.9	1.0	0.2	90.00	<0.0001
Socially useful activities	2.9	1.5	3.9	1.1	2.9	1.2	1.0	0.2	203.51	<0.0001
Personal and social relationships	2.9	1.4	3.8	1.1	2.9	1.0	1.1	1.0	218.87	<0.0001
Disturbing and aggressive behaviours	1.9	1.3	2.5	1.4	1.6	1.0	1.1	0.3	43.33	<0.0001
PSP total score	60.2	24.3	43.4	17.4	60.3	15.6	91.9	7.0	259.34	<0.0001

PSP: Personal and Social Performance; sd=standard deviation.

Duncan test showed that in all areas and global score the 3 groups were different among them.

Table 3 Principal component analysis of PSP items. Factor loadings

	Factor analysis 1		Factor analysis 2	
	Component		Component	
	I		I	II
PSP				
Item 1. Self-care	0.8756		0.7578	
Item 2. Socially useful activities	0.9177		0.9230	
Item 3. Personal and social relationships	0.9027		0.9189	0.9546
Item 4. Disturbing and aggressive behaviours	0.7099			12.080
Eigenvalue	29.278		23.405	30.19
% variance explained	73.19		58.51	

PSP: Personal and Social Performance.

Table 4 Mean PSP total score according to clinical status (patient or control) and to severity according to CGI-S scores

	Patients n=244	Controls n=76	Statistical test	<i>p</i>
Mean PSP total score (sd)	50.3 (18.6)	91.9 (6.7)	28.91 ^a	< 0.0001
Patients (n=244)				
	Mildly ill n=41	Moderately ill n=87	Severely ill n=116	
Mean PSP total score (sd)	73.0 (8.4)	56.6 (14.5)	37.5 (13.2)	128.18 ^{b,c} < 0.0001

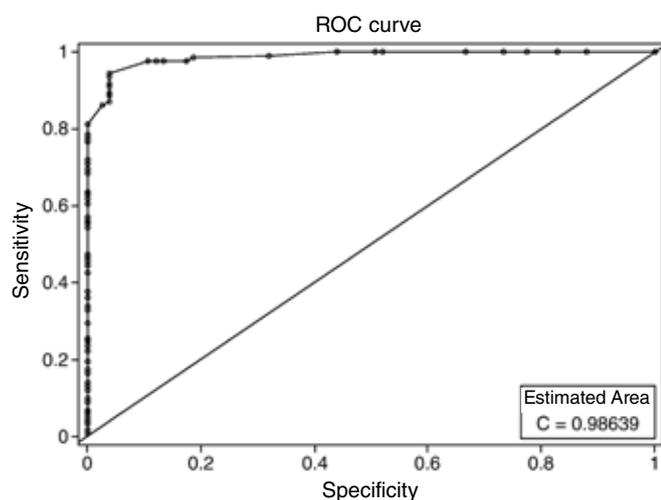
PSP: Personal and Social Performance; sd: standar deviation.

Duncan test showed that in all areas and global score the 3 groups were different among them.

^aIndependent t test.

^bANOVA F value.

^cDuncan test.

**Figura 1** Total PSP score ROC curve.

for assessing personal and social functioning in patients with schizophrenia in daily clinical practice.

PSP total score for stable patients (60.3) was very similar to the scores reported by Apiquian et al.¹⁸ and Kawata and

Revicky²¹ in stable outpatients (64.5 and 64.9 respectively). In the case of unstable patients, we obtained a slightly lower total score (43.4) compared to those described by Apiquian et al.¹⁸ and Patrick et al.²⁰ in acutely ill patients (52.7 and 49.6 respectively).

Internal consistency for the total PSP score by far exceed 0.70 (0.87), the lower limit widely used to indicate adequate reliability. This result confirms the former findings from the other validation studies,^{6,18,21} and strengthens the argument to use the PSP in patients with schizophrenia. Test-retest reliability was excellent (0.97) and superior to the previously reported (from 0.79²² to 0.91²⁰). The very high intraclass coefficient obtained in this study may be due to the fact that baseline ratings were available to the raters. However, it is also necessary to consider that the interval between the two assessments was 1 week; a very short-time in which was very unlikely that changes in personal and social functioning in stable patients happened. A lower coefficient was obtained by Nasrallah et al.²² It is important to highlight that in this study the interval between the two assessments was 150 days. The study of Patrick et al.²⁰ shown a very close coefficient to ours, in spite of using acutely exacerbated patients in which significant changes in the PSP areas of socially useful activities and disturbing

Table 5 PSP total score change for each CGI-C category

CGI-C category	Patients n= 126	PSP total score improvement Mean basal - follow-up difference (95% CI) ^b	t value ^a	<i>p</i>
1. Very much improved	23	-34.0 (-43.0 - -24.9)	-7.79	<0.0001
2. Much improved	32	-15.7 (-18.6 - -12.7)	-10.88	<0.0001
3. Minimally improved	31	-8.4 (-11.6 - -5.2)	-5.41	<0.0001
4. No change	29	0.4 (-1.6 - 2.4)	0.39	0.6993
5. Minimally worse	8	3.7 (-7.7 - 15.2)	0.77	0.4657
6. Much worse	3	19.0 (-30.9 - 68.9)	1.64	0.2428

PSP: Personal and Social Performance; sd: standar deviation.

^aPaired t test.

^bConfidence Interval.

and aggressive behaviours were very likely to occur, even in the short interval (48-72 hours) employed in the study.

The principal component analysis performed confirms the existence of one component. As in the case of Kawata and Revicky,²¹ the disturbing and aggressive behaviours had lower loading than the other three items, suggesting that this area assess a different type of functioning. Thus, we forced a second analysis in order to obtain 2 components, personal activities and relationships, and aggressive behaviour. With this bi-component model the percentage of the variance explained increased from 73.2% to 88.7%

The correlation coefficient between the total PSP score and the score on the SOFAS was as expected, positive and strong in magnitude, and almost identical to the reported by Juckel et al.⁶ On the contrary, the correlation coefficient with the CGI-S was higher than expected, and greater than the coefficients reported in other validation studies -from -0.44 to -0.60-.^{18,20-22} This may be explained by the fact that both instruments were rated by the same raters, as in the study of Patrick et al.,²⁰ and a halo effect happened. If this is true, the halo effect would also affect to the excellent convergent validity found with the SOFAS (0.954).

We found that the PSP is able to discriminate between patients and controls and among degrees of severity illness in the expected direction. Patients obtained significantly lower total PSP score than controls. In addition, patients severely ill scored significantly lower than moderately and mildly ill patients, and in turn moderately ill patients scored significantly lower than those mildly ill. This score gradient was also demonstrated by Nasrallah et al.²² and Patrick et al.²⁰ in stable and acutely ill patients respectively.

The sensitivity and specificity of the PSP for identifying patients and controls based on their level of functioning was very good. A total PSP score at or above 80 was indicative of a level of functioning compatible with a Spanish person older than 17 years without mental or relevant physical disorder.

Finally, we demonstrated that the PSP is sensitive to change in symptom severity, as assessed by the CGI-S and the CGI-C. For each point of improvement in the CGI-S the total PSP score increases 11 points. In the case of the CGI-C, an improvement of "very much" corresponded to an increase on the total PSP score of 35 points, an improvement of "much" corresponded to an increase of 15 points, an improvement of "minimally" corresponded to an increase of 8 points, and "no change" corresponded to an increase of 0.4 points on the total PSP score. However, its ability to identify worsening was not demonstrated in this study. Possibly, it was due to the very small number of patients who showed worsening in the CGI-C; only 8 patients were rated as minimally worse and 3 patients as much worse.

The Spanish, from Spain, version of the PSP has several advantages over other instruments for the assessment of

functioning in patients with schizophrenia. In addition to being a multidimensional, brief clinician-rated instrument with a semi-structured interview for helping clinicians in the assessment process and with clearly defined operational criteria for assisting them in the scoring task, it has good psychometric properties as shown in this paper.

The external validity of this study can be considered good since the patients included are similar to stable and unstable outpatients who are on treatment for schizophrenia seen in daily clinical practice throughout Spain. On the one hand, the study inclusion and exclusion criteria were very non-restrictive. On the other hand, this was a multicentre study that included patients from nine different cities in Spain. In addition, the follow-up design and the inclusion of a control group are other two strengths of the study. However, the fact that the PSP scale was not rated by a blind rater may be one shortcoming of our study.

In summary, we were able to demonstrate that the Spanish version of the PSP is a reliable, valid, and sensitive instrument for measuring personal and social functioning in patients with schizophrenic disorders. As a brief, clinician-rated instrument, the PSP scale seems to be appropriate for use in everyday clinical practice as a mean of identifying and monitoring changes in the functioning of this population.

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Appendix 1.

Personal and Social Performance (PSP) Scale and points scale.

(1) Make note of the patient's level of dysfunction during the *past month* for the 4 main areas below. The *functioning criteria* below must be used to determine the level of dysfunction. Note that there are some common criteria for areas a-c and other criteria specifically for area d.

	Absent	Mild	Manifest	Marked	Severe	Very severe
a) Self-care	<input type="checkbox"/>					
b) Personal and social relationships	<input type="checkbox"/>					
c) Socially useful activities, including work and study	<input type="checkbox"/>					
d) Disturbing and aggressive behaviour	<input type="checkbox"/>					

Level of severity: areas a-c

- (i) Absent
- (ii) Mild: only recognised by someone who is very close to the person
- (iii) Manifest: difficulties that are clearly visible to anybody, although they do not substantially interfere with the person's ability to perform a role in this area, taking into account his/her socio-cultural context, age, sex and level of education.
- (iv) Marked: difficulties considerably hinder the person from performing his/her role in this area. The person is still capable of performing some tasks, although insufficiently and occasionally, without professional or social help. If the person is helped by someone, s/he may qualify for the previous level of functioning.
- (v) Severe: difficulties that make the person unable to perform any role in this area if not helped by a professional, or the person has a destructive role, however, there are no survival risks
- (vi) Very severe: deterioration and extreme difficulties which may put the person's survival at risk

Levels of severity: area d

- (i) Absent
- (ii) Mild: being rude, unsociable or slight complaints
- (iii) Manifest: speaking too loudly or speaking to others in a too familiar manner, or eating in a socially unacceptable way
- (iv) Marked: insulting other people in public, breaking or throwing objects, frequently behaving in a socially unacceptable way, but not dangerous way (e.g. undressing or urinating in public)
- (v) Severe: frequent verbal threats or physical attacks without intention or possible serious injuries
- (vi) Very severe: frequent aggressive acts, aimed to cause serious injuries

(2) Choose a 10-point range. The 10-point range is based on the level of dysfunction for the 4 main areas: (a) socially useful activities, including work and study; (b) personal and social relationships; (c) self-care; and (d) disturbing and aggressive behaviour.

100-91	Excellent functioning in all 4 areas. The person is held in high consideration for his/her good qualities, adequately copes with life's problems, and is involved in a wide range of interests and activities
90-81	Good functioning in all 4 areas, only has common problems or difficulties
80-71	Mild difficulties for 1 or more a-c areas
70-61	Manifest but not marked difficulties in 1 or more a-c areas or mild difficulties in d
60-51	Marked difficulties for 1 or more a-c areas or manifest difficulties in d
50-41	Marked difficulties in 2 or more areas, or severe difficulties in 1 or more a-c areas, with or without marked difficulties in d
40-31	Severe difficulties in 1 area and marked difficulties in at least 1 of the a-c areas, or marked difficulties in d
30-21	Severe difficulties in 2 a-c areas, or severe difficulties in d, with or without deterioration in a-c areas
20-11	Severe difficulties in all a-d areas or very severe difficulties in d with or without deterioration in general a-c areas. If the person reacts to provocative stimuli, the suggested rating is 20-16; if not, 15-11.
10-1	Lack of independence for basic functioning, with extreme behaviour, but with no risk to survival (6-10) or with risk to survival, e.g. death risk due to malnutrition, dehydration, infections, inability to recognise manifest dangerous situations (1-5)

(3) Adjustment within the 10-point range

- The level of dysfunction in other areas should be taken into consideration, adding points within the 10-point range (e.g. from 31 to 40). Consider:
 - Taking care of physical and psychological health
 - Accommodation, place of residence, looking after living space
 - Contributing to housekeeping activities, participating in family life or at day centre/halls of residence
 - Personal and sexual relationships
 - Looking after children
 - Social network, friends and co-workers
 - Adjusting to social norms
 - General interests
 - Using transport, telephone
 - Strategies for coping with crisis situations
- Risk and suicidal behaviour are not taken into account on this scale

(4) Write the final score (0-100):

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